The Cane Creek shale is a transgressive-regressive sequence in the lower portion of the Pennsylvanian Paradox Formation, Paradox Basin, southeast Utah. The Cane Creek is tens to near 200 feet thick, varies, and underlies by banks of salt, and divided into A, B, and C intervals by stream-valuing cycles. The B interval of the primary hydrocarbon source rock and productive zone consisting of black organic rich shale, dolomite, dolomitic siltstone, and some anhydrite. Significant porosity by up to 15% is found in the dolomite and dolomitic siltstone, but permeability is generally low (<0.1 mD), naturally occurring fractures are necessary for economic production. The A and C intervals, nearly dolomite and anhydrite, are the seals for the B interval, helping prevent fluid communication with the adjacent salt banks.

Oil production was first established from the Cane Creek shale in the 1960s. Horizontal drilling renewed the play in the 1990s, but development is slow due to difficult terrain, as well as complex stratigraphy and structure. Six fields have produced over 5.4 million barrels of oil, all by small fractions of oil. The Utah Geological Survey has conducted several studies on the Cane Creek shale and other Paradox Formation shale plays.

The Utah Geological Survey is conducting a multi-year, U.S. Department of Energy funded study of the shale of potential of the Cane Creek. In support of this study, operators have provided core and extensive core analyses which we will display, along with regional play mapping and evaluation.
**RESERVOIR PROPERTIES**

- Lithology: Dolomitic siltstone to fine-grained sandstone with interlaminated organic-rich shale and dolomitic mudstone with anhydrite
- Permeability: matrix <0.1 mD, with fractures 39 to 400 mD
- Initial Reservoir Pressure Gradient 0.85 to 0.94 psi/ft
- Gas to Oil Ratio: 765 to 800 CFG/BO

**STRUCTURE & FRACTURES**

- Faulted anticline Late Mississippian to Early Pennsylvanian
- Regional northwest-southeast, near vertical, open fracture system
- Second order folds with amplitude of 15-100 ft and wavelength of 300-3000 ft

**QUESTIONS**

1. Does thermal maturity and volume of oil generated account for production difference between Lisbon and Big Flat area?
2. If both areas generated the same volume of oil, where is the oil in the Lisbon area?
3. Is production dependent on structure, if so, are the structures in the Big Flat area better developed than in the Lisbon area?
4. Are sweet spots in the Green River and Lisbon areas still waiting to be found?
5. How much does reservoir thickness (dolomite and dolomitic siltstone) influence production?
6. Does the dolomite diagenesis in the siltstone/sandstone beds pre-date or post-date oil generation?
7. If dolomite diagenesis post-dates oil generation could the siltstone/sandstone beds have provided pathways for long distance migration?
8. Do the sealed fractures pre-date or post-date the open-fracture system and oil generation?
9. If sealed fractures pre-date oil generation, why did they not open up again when the open fracture set developed?
10. If sealed fractures post-date oil generation, did they not serve as pathways allowing oil to leak out?
11. What is the most effective artificial stimulation for the B interval?

**FURTHER WORK**

- Detailed fracture study
- How fracturing influences production
- Fluid inclusion analysis
- Maturity analysis
- Detailed geometrical characteristic and well completion analysis

**CANE CREEK UNIT 26-3**

- Core photography by Triple O Slabbing, Denver, CO., provided by Fidelity Exploration & Production
- Permeability: 0.1 mD, Porosity: 12%

**CISCO STATE 36-13**

- Thin section photos and descriptions by Core Laboratories, provided by Fidelity Exploration & Production
- Permeability: 0.14 mD

**REMINGTION 21-1H**

- Cane Creek Unit 26-3 fracture study by Core Laboratories, provided by Fidelity Exploration & Production
- cement, feldspar, dolomite and calcite
- Argilaceous Sandstone: Quartz, feldspar, dolomite rock fragment, calcite
- Depth: 7429 ft

**Cane Creek Unit 26-3**

- Core photography by Triple O Slabbing, Denver, CO.
- cement, feldspar, dolomite and calcite
- Argilaceous Sandstone: Quartz, feldspar, dolomite rock fragment, calcite
- Depth: 7431 ft

**Cane Creek Unit 26-3**

- Thin section photos and descriptions by Core Laboratories, Inc.
- cement, feldspar, dolomite and calcite
- Argilaceous Sandstone: Quartz, feldspar, dolomite rock fragment, calcite
- Depth: 7481 ft

**FURTHER WORK**

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- How fractures influence production
- Fluid inclusion analysis
- Maturity analysis
- Detailed geometrical characteristic and well completion analysis

**Grove and others 1993**

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